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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/677,629 10/03/00 NAKAO

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MM91/1024

EXAMINER

MARTIN, L

ART UNIT

PAPER NUMBER

2855

DATE MAILED:

10/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/677,629

Applicant(s)

NAKAO ET AL.

Examiner

Lilybett Martir

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

27. Correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- In claim 1, the recitation of "said entry-side and exit-side manifolds being smoothly bent from an inlet of said entry-side manifold and an outlet of said exit-side manifold to joints connecting to said two flow tubes" makes said claim indefinite because it is unclear how the manifolds are bent from this description.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Cage (Pat. 4,768,385). Cage teaches the claimed invention, including:

- Two parallel flow tubes as in elements 130 and 130', an entry side manifold that branches a fluid being measured from an inlet port into said two flow tubes as in element 100, an exit-side manifold that converges flows of said fluid being measured flowing in said two flow tubes into an outlet port to discharge said fluid being measured as in element 100', a drive unit for driving and resonating a flow tube at mutually opposite phases as in element 180, a pair of oscillator sensors installed at locations horizontally symmetrical with respect to the installation location of said drive unit for sensing a phase difference proportional to a Coriolis force as in elements 160,160',161 and 161', said flow tubes as in elements 130 and 130' being formed into an arch shape that is bent in only one direction as noted in Figure 1, and said entry-side and exit-side manifolds being smoothly bent as noted in Figure 4 from an inlet of said entry-side manifold and an outlet of said exit-side manifold to joints as in elements 120,120',110 and 110' (Col. 4, lines 59-63) connecting to said two flow tubes, and connected to said flow tubes at said joints at a predetermined rise angle in the same direction as said flow tubes, as in claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cage in view of Zасhel (Pat. 5,549,009). Cage teaches all the elements of the claimed invention, except for:

- A sealed pressure-resistant case of a cylindrical shape in axis direction, with openings of the cylindrical portion thereof closed by end plates, wherein said entry-side and exit-side manifolds are installed at corners of said cylindrical portion and passed through said corners, as in claim 2.

Zасhel teaches a mass flow determination apparatus that has a sealed pressure-resistant case as in element 38 of a cylindrical shape in an axis direction, where entry and exit side manifolds are installed at the ends of said cylindrical portions passing through said corners as in Figure 2.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the Coriolis mass flow meter of Cage using the teachings of Zасhel by providing a case of a cylindrical shape over the mass flow sensor, for the purpose of protecting said sensor from environmental hazards that may alter it's functioning and accuracy.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cage in view of Zасhel (Pat. 5,549,009) and in view of Van Cleeve et al. (Pat. 5,850,039). Cage teaches all the elements of the claimed invention, except for:

- The entry-side manifolds and exit-side manifolds having a pair of integrally formed disc-shape flanges, to which both ends of said pressure resistant case are fixedly fitted; the cross-sectional shape of said pressure-resistant case being an oval shape with the major axis oriented in the curved direction of said flow tubes, with the length of said major axis smoothly and gradually reduced from the axial central part thereof to both end thereof into a substantially circular shape over a predetermined length near both ends, as in claim 3.
- A temperature sensor provided on said pressure-resistant case for compensating the thermal effects of distance between fixed ends on both sides of said flow tubes, and a temperature sensor provided near said joints connecting said flow tubes to said manifolds for compensating the thermal effects of the rigidity of said flow tubes, as in claim 4.

Zaschel teaches a mass flow determination apparatus that has a case as in element 38 that has an oval shape with the major axis oriented in the curved direction of said flow tubes, with the length of said major axis smoothly and gradually reduced from the axial central part thereof to both end thereof into a substantially circular shape over a predetermined length near both ends as noted in Figure 2.

Van Cleeve et al. teaches entry-side manifolds and exit-side manifolds having a pair of integrally formed disc-shape flanges as in elements 103, as noted in Figure 2. Also, Van Cleve et al. discloses the use of temperature sensors as in element 808 for the purpose of correcting the output information of the flow sensor (Col. 9, lines 11-31).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the Coriolis mass flow meter of Cage using the teachings of Zaszchel and Van Cleve et al. by providing a case having an oval shape oriented in the curved direction of the sensor for the purpose of protecting the sensor from environmental hazards to prevent malfunction, and entry and exit side manifolds having a pair of integrally formed disc-shape flanges for the purpose of securing said flow meter to a pipeline that is destined to be subjected to flow measurements. It would also have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the mass flow meter of Cage using the teachings of Van Cleve et al. by providing temperature sensors for the purpose of correcting the accuracy of the output information based on how the temperature affects the tension and/or elastic modulus of the tubes in the flow meter.

Citation of Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art considered pertinent during examination of the examined application is:

- Lew et al. (Pat. 5,663,509) Inertia force flowmeter.
- Cage (Pat. 4,895,031) Sensor mounting for Coriolis mass flow rate meter.
- Cage et al. (Pat. 4,876,898) High temperature Coriolis mass flow rate meter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (703)305-6900. The examiner can normally be reached on 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Fuller can be reached on (703)308-0079. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3432 for regular communications and (703)305-3432 for After Final communications.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LM

Lilybett Martir
Examiner
Art Unit 2855

LM

October 22, 2001


Benjamin R. Fuller
Supervisory Patent Examiner
Technology Center 2800